BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Applied Science Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Diploma in Environmental Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 14: Genetics and Genetic Engineering**
Learning aim(s) (For NQF only)	**D**: Explore basic DNA techniques and the use of genetic engineering technologies.
Assignment title	**Basic DNA techniques and genetic engineering technology**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	As a trainee lab technician working for a medical research company, you must be able to extract, amplify and separate samples of DNA. Your company offers work placements for sixth form students. You have been asked to help work placement students understand how to carry out practicals to extract, amplify and separate DNA, and understand how and why these technologies are used in different industries, and the potential use for them in the future, by producing a laboratory book and illustrative report.

Task	Produce a laboratory book that records how you competently carried out three separate experiments to **extract, amplify and separate** DNA. You must **carry out**: • DNA extraction (chromosomes or plasmids) from biological

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	samples • Polymerase chain reaction (PCR) to amplify the DNA samples • Gel electrophoresis to separate the amplified DNA Your tutor/assessor will complete an observation record to validate your competency in carrying out the practical work. It will clearly detail how you methodically prepared and carried out the practicals and prevented contamination. You are required to **evaluate** possible future uses of genetic engineering technologies once you have **analysed and explained** the uses of genetic engineering technologies in industry and medicine. In order to do this, you must: • **Explain and analyse,** in an illustrated report**,** the current uses and relevance of genetic engineering technologies (DNA extraction, DNA amplification, gel electrophoresis, and transformation of cells) in industry and medicine. You should include the scientific principles behind each technology. • Using real-life examples, include reasons for carrying out each technology and the benefits to the relevant sector, including an appraisal of efficacy and cost. • **Evaluate** the possible future uses of genetic engineering technologies. • Research the strengths and weaknesses, advantages and disadvantages of genetic technologies (DNA extraction, DNA amplification, gel electrophoresis, and transformation of cells) to speculate, in an informed manner, about specific future uses of generic engineering technologies. Your counterarguments must include discussion of the reliability and validity of the use of the technologies. • You must accurately reference your sources.
Checklist of evidence required	• a laboratory book with practical write ups of each practical carried out to extract, amplify and separate DNA • an observation record to validate your competency in the practical work • an illustrated report, analysing and explaining genetic engineering technologies and evaluating possible future uses.
Criteria covered by this task:	

Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
D.D4	Evaluate possible future uses of genetic engineering technologies.
D.M6	Analyse the uses of genetic engineering technologies in industry and medicine.
D.P6	Extract, separate and amplify DNA.
D.P7	Explain the use of genetic engineering technologies in industry and medicine.

Sources of information to support you with this Assignment	http://learn.genetics.utah.edu/content/labs/ https://www.foe.co.uk/sites/default/files/downloads/gm_crops_food.pdf https://ghr.nlm.nih.gov/primer/therapy/procedures http://www.nhs.uk/news/2012/01January/Pages/embyonic-stem-cell-trial-macular-degeneration.aspx Above are some examples of websites. Further useful resources may be found at: http://qualifications.pearson.com/en/support/published-resources.html#step1